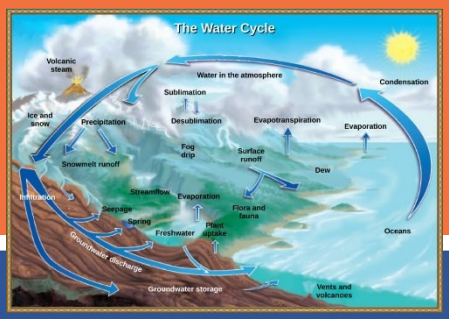
ETMA 352
Land and Water Management Systems
Fall 2022

When the well is dry, we know the worth of water. . . .

- Benjamin Franklin



WELCOME!

Course Description:
This course introduces the students to the principles, theories, practices, and applications in managing our water and land resources. The lecture is centered on environmental hydrology while the laboratory focuses on the tools and emerging technologies used to manage our water and land resources. Topics included are the hydrologic cycle, precipitation, soil water, evaporation/transpiration, runoff, open channel flow, erosion, hydrogeology, and introduction to GIS.

Learning Objectives:
To help students develop the computational skill sets needed to manage our water and land resources through hands-on problem-solving experience. At the end of the course, students are expected to:

- Understand the processes in the hydrologic cycle
- Solve basic problems involving the processes in the hydrologic cycle
- Learn basic ArcGIS operations to visualize, manipulate, and analyze spatial data
- Improve problem solving, computational, and basic computer skills.

Credit: 3 hours

One-on-one support:

- Lecture exercises:
  - Tuesday 9:00 - 10:00 via ZOOM
  - In person (332 N) – open door policy
- Laboratory:
  - Friday 9:00 – 10:00 via ZOOM
- Discussion board (weekdays)

Course Materials:

- Environmental Hydrology by Ward, Trimble, Burckhard, and Lyon (3rd Edition)
- GIS Fundamentals by Paul Bolstad
- Lectures and Laboratory notes (available in Canvas)
- Online resources for ArcGIS
- Tools/software:
  - Canvas
  - ArcGIS
  - MS Office (Excel, Powerpoint, Word)
  - Zoom meeting

Instructor:
I am an associate professor in the Department of Agricultural and Biological Engineering. My research area of specialty is watershed-ecosystem dynamics where I study the intricate interactions between natural and human drivers and the ecosystem to achieve a sustainable agro-production system where productivity, environmental soundness, and social relevancy are optimized.

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Class Structure:

The course is 16 weeks long divided into weekly modules delivered via an ***asynchronous*** platform in Canvas (https://illinoisedu.instructure.com). You work at your own pace, but all deliverables have due dates. The lecture is composed of pre-recorded videos followed by short quizzes and hands-on exercises, while the laboratory exercises follow a tutorial format (Figure 1). You should dedicate approximately 6 - 7 hours per week to working on the course itself, but actual time commitments will vary depending on your input, needs, and personal study habits. The weekly modules are available 2 weeks in advance to allow you more time to work on the deliverables as your schedule permits.

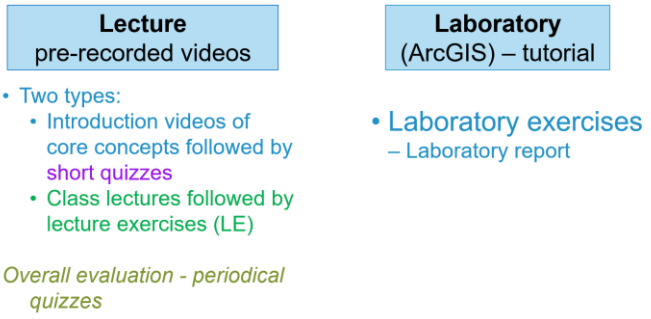

Figure 1. Class structure and activities

Schedule:

Reminders of the weekly activities, deliverables, and due dates are sent out via email (as announcement) every Monday morning. The due dates of the deliverables will appear in your course calendar and in the course homepage in Canvas. Please take note that changes in the schedule may occur. You will be notified if this happens, and the calendar will be updated right away. Below is the tentative schedule of our course:

Week	Date	Introduction and Short Quizzes	Due Date	Class Lecture and Exercises (LE)	Due Date	Periodical Quizzes	Due Date	Laboratory		Due Date
								No.	Description	
1	22-Aug	Introduction to ETMA 352		LE0: "All about me"	23-Aug	Q0: Orientation Quiz	26-Aug	Lab 1	Installing ArcGIS/Remote Access	26-Aug
2	29-Aug	Hydrologic Cycle; Water Use	29-Aug			Q1: Water use and Hydrologic cycle	2-Sep	Lab 2	Latitude and Longitude	2-Sep
3	5-Sep	Precipitation (Qa)	5-Sep	LE1: Precipitation 1	6-Sep					
4	12-Sep	Introduction to GIS (Qb)	12-Sep	LE2: Precipitation 2	13-Sep			Lab 3	Introduction to ArcGIS	16-Sep
5	19-Sep			LE3: Precipitation 3	20-Sep	Q2: Precipitation	23-Sep			
6	26-Sep	Soil Water (Qc)	26-Sep	LE4: Soil water	27-Sep			Lab 4	Introduction to ArcGIS	30-Sep
7	3-Oct	Evaporation (Qd)	3-Oct	LE5: Evaporation	4-Oct	Q3: Soil water and Evaporation	7-Oct			
8	10-Oct	Runoff 1 (Qe)	10-Oct	LE6: Runoff 1	11-Oct			Lab 5	Coordinate System: Projections	14-Oct
9	17-Oct	Runoff 2 (Qf)	17-Oct	LE7: Runoff 2	18-Oct			Lab 6	Data and Tables	21-Oct
10	24-Oct			LE8: Runoff 3	25-Oct	Q4: Runoff	28-Oct			
11	31-Oct	Open Channel Flow 1 (Qg)	31-Oct	LE9: Open Channel Flow 1	1-Nov			Lab 7	Vector Analysis	4-Nov
12	7-Nov	Open Channel Flow 2 (Qh)	7-Nov	LE10: Open Channel Flow 2	8-Nov	Q5: Open Channel Flow	11-Nov			
13	14-Nov	Erosion (parts 1 and 2) (Qi)	14-Nov	LE11: Erosion	15-Nov			Lab 8	Raster Analysis	18-Nov
14	21-Nov	*Thanksgiving*								
15	28-Nov	Groundwater (Qj)	28-Nov	LE12: Groundwater	29-Nov	Q6: Erosion and Groundwater	2-Dec			
16	5-Dec							Lab 9	Terrain Analysis	9-Dec

Due dates:

- Short quizzes (Qa to Qj) – **Monday** at midnight
- Lecture exercises (LE0 to LE12) – **Tuesday** at midnight
- Periodical quizzes (Q0 to Q6) and Lab report (Lab 1 to Lab 9) – **Friday** at midnight

Class Policies:

Quizzes: Two sets of quizzes will be given in this course: (1) short quizzes following the pre-recorded video lectures, and (2) periodical quizzes following the completion of each major topic. The short quizzes contain questions from the videos and should be completed at the end of Monday. Your score will be added as extra credit to the periodical quizzes. Periodical quizzes cover everything about the topic (e.g., precipitation) and questions can come from the videos and lecture exercises. The periodical quizzes should be taken before Friday (midnight) of the week they are given.

Lecture Exercises: Lecture exercises are weekly hands-on activities where you apply the concepts you learned to answer questions and solve problems. The lecture exercises must be completed online (Canvas) before midnight on Tuesdays. You should include the step-by-step solution and other materials to substantiate your answers. If your answers/solutions are handwritten, take a picture of your work and upload the image in the answer field. Be sure that the image is clear, and the writings are legible. **Late exercises will NOT be accepted**. Answers should be done neatly with the problem defined and solution clearly outlined. Final answers should

have appropriate units and should be circled or bolded or underlined. The more clearly a problem is presented and solved, the more likely you will receive partial credit. In this course, it is permissible to discuss lecture exercises and solutions with classmates. However, it is NOT permissible to just copy the answers (including computer produced outputs) from another student and submit them as your own. Breach of this policy will result in a zero for all involved parties.

Laboratory Reports: Laboratory reports should contain the results (deliverables) of your laboratory exercises. They should strictly follow the correct laboratory report format and should be uploaded as a SINGLE word (*.docx or *.pdf) before midnight of the due date. Uploaded files that are not of this type (*.docx or *.pdf) will not be accepted. Late work will be deducted 10 points for each day of being late.

Office hours: Please observe the following guidelines for office hours:

- Questions regarding LE and lab exercises should be asked during the zoom one-on-one sessions or through the discussion board.
- Walk-ins are welcome whenever the instructor is available (just knock).
- There is no guarantee that emails will be answered in a timely manner especially during weekends and nighttime.
- You have at most one week from the due date to verify quiz, LE, and lab scores.

Make-up activities: For students with DRES accommodation or medical conditions, due dates of quizzes, LE, and Lab can be extended to up to 3 days.

Grading:

Your final grade will be made up of the periodical quizzes (30%), lecture exercises (40%), and laboratory reports (30%) broken down as follows (Figure 2):

Components	%	Total Points
Periodical quizzes	30	95
Lecture exercises	40	500
Laboratory reports	30	800

Extra credits:

- Short quizzes (Qa – Qj)
- LE0: All about me

Periodical quizzes	points
Q0	5
Q1	15
Q2	15
Q3	15
Q4	20
Q5	10
Q6	15
Total	**95**

LE	points
LE1	20
LE2	40
LE3	40
LE4	50
LE5	50
LE6	30
LE7	30
LE8	40
LE9	50
LE10	50
LE11	60
LE12	40
Total	**500**

Lab	points
2	100
3	100
4	100
5	100
6	100
7	100
8	100
9	100
Total	**800**

Final grade equivalent

	absolute	eq
A+	97-100	4
A	93-96	4
A-	90-92	3.67
B+	86-89	3.33
B	83-85	3
B-	80-82	2.67
C+	76-79	2.33
C	73-75	2
C-	70-72	1.67
D+	67-69	1.33
D	63-66	1
D-	60-62	0.67
F	0-59	0

$$FG = \left[0.3\left(\frac{Qperiod\ total}{95}\right) + 0.4\left(\frac{LE\ total}{500}\right) + 0.3\left(\frac{Lab\ total}{800}\right)\right]100$$

To pass FG ≥ 60

Figure 2. Number of points of every grade component. Your final grade, FG, should be 60 or better to pass (i.e., 59 is F)

Additional Resources:

Netiquette Statement (Courtesy of CITL): In any social interaction, certain rules of etiquette are expected and contribute to more enjoyable and productive communication. The following are tips for interacting online via e-mail or discussion board messages, adapted from guidelines originally compiled by Chuq Von Rospach and Gene Spafford (1995):

- Remember that the person receiving your message is someone like you, deserving and appreciating courtesy and respect
- Avoid typing whole sentences or phrases in Caps Lock
- Be brief; succinct, thoughtful messages have the greatest effect
- Your messages reflect on you personally; take time to make sure that you are proud of their form and content • Use descriptive subject headings in your e-mails
- Think about your audience and the relevance of your messages
- Be careful when you use humor and sarcasm; absent the voice inflections and body language that aid face-to-face communication, Internet messages are easy to misinterpret
- When making follow-up comments, summarize the parts of the message to which you are responding
- Avoid repeating what has already been said; needless repetition is ineffective communication
- Cite appropriate references whenever using someone else's ideas, thoughts, or words

Academic Integrity: Academic misconduct (plagiarism, cheating, or other forms of misconduct as defined by the university) will not be tolerated in this course. Academic Misconduct is defined as any activity which tends to compromise the academic integrity of the institution or subvert the educational process. According to Article 1 of the Student Rights and Responsibilities - Part 4 (Academic Integrity and Procedure): No student shall use or attempt to use in any academic exercise materials, information, study aids, or electronic data that the student knows or should know is unauthorized. This includes copying, direct quotation without citation, paraphrasing without citation, or providing false or misleading information for the purpose of gaining an academic advantage. Please see Academic Integrity Infractions at: http://studentcode.illinois.edu/article1_part4_1-402.html for a complete outline.

Students with Disabilities: To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor as soon as possible. To insure that disability-related concerns are properly addressed from the beginning, students with disabilities who require assistance to participate in this class should contact Disability Resources and Educational Services (DRES) and see the instructor as soon as possible. If you need accommodations for any sort of disability, please speak to me after class, or make an appointment to see me, or see me during my office hours. DRES provides students with academic accommodations, access, and support services. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TDD), or e-mail a message to disability@uiuc.edu. http://www.disability.illinois.edu/.

Emergency Response Recommendations: Emergency response recommendations can be found at the following website: http://police.illinois.edu/emergency/. I encourage you to review this website and the campus building floor plans website within the first 10 days of class. http://police.illinois.edu/emergency/floorplans/ .

Family Educational Rights and Privacy Act (FERPA): Any student who has suppressed their directory information pursuant to *Family Educational Rights and Privacy Act* (FERPA) should self-identify to the instructor to ensure the protection of the privacy of their attendance in this course. See http://registrar.illinois.edu/ferpa for more information on FERPA.

Sexual Misconduct Policy and Reporting: The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX and Disability Office. In turn, an individual with the Title IX and Disability Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: wecare.illinois.edu/resources/students/#confidential. Other information about resources and reporting is available here: wecare.illinois.edu.